Lloyd's Register

Rules and Regulations for the Classification of Ships, July 2009

Notice No. 1

Updated version of Notice 1 incorporating Errata Note

Effective Date of Latest Amendments:

See page 1

Issue date: December 2009

RULES AND REGULATIONS FOR THE CLASSIFICATION OF SHIPS, *July 2009*

Notice No. 1

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Ships, July 2009.* The amendments are effective on the dates shown:

Part	***Chapter***	***Section***	***Effective date***
1	2	1	1 January 2010
1	3	1, 3, 5, 9	1 January 2010
3	2	2	Corrigendum
3	4	8	Corrigendum
3	13	7	Corrigenda
5	2	3, 16	Corrigenda
5	12	4	Corrigendum
6	2	18	Corrigendum
8	2	11	Corrigenda

It will be noted that the amendments also include corrigenda, which are effective from the date of this Notice.

The *Rules and Regulations for the Classification of Ships, July 2009* are to be read in conjunction with this Notice No. 1. The status of the Rules is now:

Rules for Ships	Effective date:	July 2009
Notice No. 1	Effective dates:	1 January 2010 & Corrigenda

Part 1, Chapter 2
Classification Regulations

■ *Section 1*
Conditions for classification

1.1 General

1.1.12 Where a ship has been detained by Port State Control the Owner is to advise LR immediately in order to arrange the attendance of a Surveyor.

This Errata Note has rectified an error made in Notice No. 1. The text has been reinstated to its original form as in the 2009 Rules for Ships.

Part 1, Chapter 3
Periodical Survey Regulations

Effective date 1 January 2010

■ *Section 1*
Conditions for classification

1.5 Definitions

1.5.16 **A Corrosion Prevention System** is normally considered a full hard protective coating. This is usually to be an epoxy coating or equivalent. Other systems ~~(e.g. soft coatings)~~ with the exception of soft and semi-hard coatings, may be considered acceptable as alternatives provided they are applied and properly maintained in compliance with the manufacturer's specification.

1.6 Preparation for survey and means of access

(Part only shown)

1.6.8 Survey at sea or anchorage may be undertaken when the Surveyor is fully satisfied with the necessary assistance from the personnel onboard and provided the foregoing preparations for survey, as applicable, have been met. In addition, the following conditions and limitations are to be applied:

(b) Surveys of tanks by means of boats or rafts are to be agreed with the attending Surveyor, who is to take into account the safety arrangements provided, including weather forecasting and ship response under foreseeable sea conditions and provided the expected rise of water within the tank does not exceed 0,25 m.

Where it has been agreed to use boats or rafts when carrying out close-up survey, the following conditions are to be observed:

(iv) The surface of water in the tank is to be calm and the water level ~~either~~ stationary ~~or falling~~. On no account is the level of the water to be rising while the boat or raft is in use.

1.6.9 Where soft or semi-hard coatings have been applied, safe access is to be provided for the Surveyor to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures which may include spot removal of the coating. When safe access cannot be provided, the soft or semi-hard coating is to be removed.

(Part only shown)

1.6.11 For ships assigned the quotation **ESP**, the owner is to respond to a Survey Planning Questionnaire and to prepare a Survey Programme, *see* 6.3, 7.3 and 8.3. In such cases, the following requirements are applicable:

(e) Prior to the commencement of any part of the Intermediate Survey and Special Survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, the thickness measurement company operator (as applicable) and the Master of the ship or an appropriately qualified representative appointed by the Master or Ship Manager for the purpose of ascertaining that all the arrangements envisaged in the Survey Programme are in place, so as to ensure the safe and efficient conduct of the survey to be carried out. The following is an indicative list of items that are to be addressed in the meeting:

1.7 Thickness measurement at surveys

1.7.3 For non-**ESP** ships less than 500 gross tons and all fishing vessels, the designated Surveyor, who has received specific training and been qualified by LR, may carry out thickness measurements. ~~The Owner is to respond to a Survey Planning Questionnaire and to prepare a Survey Programme, see 6.3, 7.3 and 8.3.~~

■ *Section 3*
Intermediate Surveys – Hull and machinery requirements

3.2 Intermediate Surveys

3.2.4 For **oil tankers** (including ore/oil and ore/bulk/oil ships) and **chemical tankers**, salt-water ballast tanks are to be examined and gauged as necessary at Annual Surveys where:

(a) A hard protective coating has not been applied from the time of construction; or
(b) A soft or semi-hard coating has been applied; or
(c) Substantial corrosion is found within the tank, or
(d) The hard protective coating is found to be in less than GOOD condition, as defined in 1.5, and the hard protective coating is not repaired to the satisfaction of the Surveyor.

(Part only shown)

3.2.5 For salt-water ballast tanks on those ships not listed in 3.2.4, where a hard protective coating is found to be in POOR condition, as defined in 1.5, and it has not been repaired, where a soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction the following requirements are applicable:

(Part only shown)

3.2.6 For ships over 5 years of age and up to 10 years of age, representative salt-water ballast tanks are to be examined. In addition to this, the following requirements are applicable:

(e) Where a hard protective coating is found to be in POOR condition, as defined in 1.5, where a soft or semi-hard coating has been applied, where a protective coating was not applied from the time of construction or other defects are found, the survey is to be extended to other ballast tanks of the same type.

■ *Section 5*
Special Survey – General – Hull requirements

5.3 Examination and testing

5.3.3 For **oil tankers** (including ore/oil and ore/bulk/oil ships) and **chemical tankers**, the condition of the corrosion prevention system, where provided, is to be examined in cargo tanks and salt-water ballast tanks. Thickness measurements are to be carried out as deemed necessary by the Surveyor. Ballast tanks are to be examined and gauged as necessary at Annual Surveys where:

(a) A hard protective coating has not been applied from the time of construction, or
(b) A soft or semi-hard coating has been applied, or
(c) Substantial corrosion is found within the tank, or
(d) The hard protective coating is found to be in less than GOOD condition, as defined in 1.5, and the hard protective coating is not repaired to the satisfaction of the Surveyor.

(Part only shown)

5.3.4 For those ships not listed in 5.3.3, the condition of the corrosion prevention system, where provided, in salt-water ballast tanks is to be examined. Thickness measurements are to be carried out as deemed necessary by the Surveyor. Where a hard protective coating is found to be in POOR condition, as defined in 1.5, and it has not been repaired, where a soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction the following requirements are applicable:

5.3.21 For engine room and machinery space fire dampers the following is applicable:

(a) At Special Survey I, Surveyors are to select and internally examine one engine room fire damper and one machinery space fire damper. Where considered necessary by the Surveyor as a result of the examinations, the extent of examinations may be extended to include other fire dampers.
(b) At each subsequent Special Survey, all engine room and machinery space fire dampers are to be internally examined by the Surveyor.

NOTE:
The examination of fire dampers may be specially considered by the Surveyor where there is satisfactory documented evidence of their replacement within the previous five years.

■ *Section 9*
Ships for liquefied gases

9.6 Intermediate Surveys

9.6.3 For ships over 5 years of age and up to 10 years of age, an overall survey of representative ballast tanks is to be carried out. Where a hard protective coating is found to be in POOR condition, as defined in 1.5, where a soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction, the survey is to be extended to other ballast tanks of the same type.

(Part only shown)

9.6.4 For ships over 10 years of age, an overall survey of all ballast tanks is to be carried out.

(b) For ballast tanks, where a hard protective coating is found to be in POOR condition, as defined in 1.5, where a soft or semi-hard coating has been applied or where a protective coating was not applied from the time of construction the following requirements are applicable:

Part 3, Chapter 2
Materials

CORRIGENDUM

■ *Section 2*
Fracture control

2.1 Grades of steel

Table 2.2.1 Material classes and grades (*Part only shown*)

Structural member category	Material class/grade
SHIPS WITH LENGTH EXCEEDING 250 m	
E1. Sheer strake (or rounded gunwale) and stringer plate at strength deck, *see* Note 2	Grade E/EH within 0,4*L* amidships
E2. Bilge strake, *see* Note 2	Grade D/DH within ~~0,4*L*~~ 0,6 *L* amidships

Part 3, Chapter 4
Longitudinal Strength

CORRIGENDUM

■ *Section 8*
Loading guidance information

8.2 Loading Manual

(Part only shown)

8.2.5 In addition to the requirements of 8.2.4, the Manual is to contain the following information for bulk carriers (*see* 3.2.2), ore carriers and combination carriers of length, *L*, 150 m or above:

(e) The maximum rate of ballast exchange, together with advice that a load plan is to be agreed with the terminal on the basis of achievable rates of exchange.

For bulk carriers for which it is required to undertake longitudinal strength calculations in the flooded condition, *see* ~~Pt 4, Ch 7,1.2.2~~ Pt 4, Ch 7,3.1.2, the Manual is also to contain envelope results and permissible limits of still water bending moments and shear forces for hold flooded conditions, *see* Pt 4, Ch 7,3.4.

Part 3, Chapter 13
Ship Control Systems

CORRIGENDA

■ *Section 7*
Equipment

7.1 General

Table 13.7.1 Equipment requirements (*continued*)

Ship type	Service	Required equipment
Trawlers, stern trawlers, fishing vessels	Unrestricted service	(5) *See* Table 13.7.4, and Notes to Table 13.7.3 using N_C Anchor chains — Where L < 30 m, may be replaced with wire ropes of equal strength. Where 30 m ≤ L ≤ 40 m, one chain cable may be replaced with wire rope of equal strength provided normal chain cable maintained for the second line. Wire ropes of trawl winches complying with above may be used as anchor cables. cable — Wire ropes substituted for anchor chains should (a) have a length 1,5 times that for chain required by Table 13.7.4 and (b) have a length Grade U2/U1 of chain not less than 12,5 m between anchor and wire rope. Hawsers and warps — Sufficient in number and strength for proper working of the ship
For symbols, *see* continuation of Table		
Tugs	Unrestricted and restricted service	(6) *See* Table 13.7.2 and Table 13.7.3 using N_C except as stated below Stream anchor — not required Towlines — adequate for tug's maximum bollard pull with factor of safety ≥ 2,0
	Service restricted, *see* Pt 1, Ch 2,2.3.7 to 2.3.10	(7) *See* Table 13.7.2 and Table 13.7.3 using N_C Mass of bower anchor, Chain cable diameter — reduced to correspond to two Equipment Letters below that required for N_C Anchor chains — As item (2) in this Table
	Protected waters service, *see* Pt 1, Ch 2,2.3.6	(8) *See* Table 13.7.2 using N_A and Table 13.7.3 using N_c Mass of bower anchor, Chain cable diameter — $N_A = 0{,}5N_C$ Chain cable length — = 0,5 times length required by N_A Where N_C < 90, the requirements for anchors and chain cable will be specially considered Anchor chains — As item (2) in this Table
Offshore supply ships	Unrestricted service	(9) *See* Tables 13.7.2 and 13.7.3, using N_C Chain cable length and diameter — increased to correspond to two Equipment Letters above that required for N_C. Need not be applied for ships with **DP(AAA)**, **DP(AA)** or **DP(AM)** notations
Manned barges and pontoons	Service restricted, *see* Pt 1, Ch 2,2.3.7 to 2.3.10	(10) As item (3) in this Table

Part 5, Chapter 2
Oil Engines

CORRIGENDA

■ *Section 3* **Design**

3.4 Stress concentration factors

3.4.4 Crankpin oil bore stress concentration factors for radially drilled oil holes:

- Bending

$$\gamma_B = 3 - 5{,}88 \bullet ~~d_o~~ \frac{d_o}{D_p} + 34{,}6 \bullet ~~d_o~~ \left(\frac{d_o}{D_p}\right)^2$$

- Torsion

$$\gamma_T = 4 - 6 \bullet ~~d_o~~ \frac{d_o}{D_p} + 30 \bullet ~~d_o~~ \left(\frac{d_o}{D_p}\right)^2$$

3.5 Nominal stresses

3.5.3 Nominal alternating bending stress:

$$\sigma_b = \pm \frac{M_b}{Z_{web}} k_e \quad N/mm^2$$

$$~~S_{web}~~ Z_{web} = \frac{BT^2}{6} \quad mm^3$$

k_e = 0,8 for crosshead engines
= 1,0 for trunk piston engines.

3.5.4 Nominal alternating bending stress in the outlet of the crankpin oil bore:

$$\sigma_{BON} = \pm \frac{M_{BON}}{Z_{crankpin}}$$

where

M_{BON} is taken as the ½ range value M_{BON} = $\pm$ ½ ($M_{BOmax} - M_{BOmin}$)

and

M_{BO} = (M_{BTO} cosψ + M_{BRO} sinψ) *see* Fig. 2.3.3

The two relevant bending moments are taken in the crankpin cross-section through the oil bore.

M_{BRO} = bending moment of the radial component of the connecting-rod force

M_{BTO} = bending moment of the tangential component of the connecting-rod force

$$~~S_{crankpin}~~ Z_{crankpin} = \frac{\pi}{32} \frac{D^4 - d^4}{D} ~~S_{crankpin}~~ Z_{crankpin}$$ related to cross-section of axially bored crankpin.

■ *Section 16* **Alarms and safeguards for emergency diesel engines**

16.3 Alarms and safeguards

16.3.5 Grouped alarms of at least those items listed in Table ~~2.14.1~~ 2.16.1 are to be arranged on the bridge.

16.3.7 Local indications of at least those items listed in Table ~~2.14.1~~ 2.16.1 are to be provided within the same space as the diesel engines and are to remain operational in the event of failure of the alarm and safety systems.

Part 5, Chapter 12
Piping Design Requirements

CORRIGENDUM

■ *Section 4* **Cast iron**

4.1 Spheroidal or nodular graphite cast iron

4.1.5 Where the elongation is less than the minimum required by ~~4.1.1~~ 4.1.2, the material is, in general, to be subject to the same limitations as grey cast iron.

Part 6, Chapter 2
Electrical Engineering

CORRIGENDUM

■ *Section 18*
Ship safety systems

18.3 Bow and inner doors

18.3.15 Television surveillance arrangements are to be provided that allow the extent of leakage to be readily assessed from the navigation bridge and the engine control room, or equivalent attended position, in the event of leakage through the doors. *See also* ~~Pt 4, Ch 2,10.2~~ Pt 4, Ch 2,11.2.8.

Part 8, Chapter 2
Ice Operations – Ice Class

CORRIGENDA

■ *Section 11*
Machinery strengthening requirements for navigation in multi-year ice conditions – Ice Classes PC1, PC2, PC3, PC4, PC5, PC6 and PC7

11.9 Design ice loads for open propeller

11.9.1 The maximum backward blade force, F_b, is to be taken as:
when $D < D_{limit}$

$$F_b = -27 S_{ice} (nD)^{0,7} \left(\frac{EAR}{Z} \right)^{0,3} D^2 \quad \text{kN}$$

when $D \geq D_{limit}$

$$F_b = -23 S_{ice} (nD)^{0,7} \left(\frac{EAR}{Z} \right)^{0,3} (H_{ice})^{1,4} D \quad \text{kN}$$

where
D_{limit} = $0,85 (H_{ice})^{1,4}$
n = the nominal rotational speed in rev/sec (at MCR free running condition) for CP-propeller and 85 per cent of the nominal rotational speed (at MCR free running condition) for a FP-propeller (regardless of driving engine type).

11.9.6 The maximum propeller ice torque applied to the propeller is to be taken as:
when $D < D_{limit}$

$$Q_{max} = 105 \left(1 - \frac{d}{D}\right) S_{qice} \left(\frac{P_{0,7}}{D} \right)^{0,16} \left(\frac{t_{0,7}}{D} \right)^{0,6} (nD)^{0,17} D^3 \quad \text{kNm}$$

when $D \geq D_{limit}$

$$Q_{max} = 202 \left(1 - \frac{d}{D}\right) S_{qice} H_{ice}^{1,1} \left(\frac{P_{0,7}}{D} \right)^{0,16} \left(\frac{t_{0,7}}{D} \right)^{0,6} (nD)^{0,17} D^{1,9} \quad \text{kNm}$$

where
D_{limit} = $1,81 H_{ice}$
S_{qice} = ice strength index for blade ice torque
$P_{0,7}$ = propeller pitch at 0,7R, in m
= for CP propellers, $P_{0,7}$ is to correspond to MCR in bollard condition. If not known, $P_{0,7}$ is to be taken as $0,7 P_{0,7n}$
$P_{0,7n}$ = propeller pitch at MCR free running condition
$t_{0,7}$ = maximum thickness at 0,7R
n = the rotational propeller speed, in ~~rps~~ rev/sec, at bollard condition. If not known, n is to be taken as follows:
for CP propellers and FP propellers driven by turbine or electric motor = n_n
for FP propellers driven by diesel engine = $0,85 n_n$
n_n = the nominal rotational speed at MCR, free running condition.

Published by Lloyd's Register
Registered office
71 Fenchurch Street, London, EC3M 4BS
United Kingdom